

Association of Menopause with Osteopenia and Osteoporosis: Results from Population Based Study Done in Karachi

Lubna Baig¹, Farah Asad Mansuri² and Saadiya A. Karim³

ABSTRACT

Objective: To assess the association of osteopenia and osteoporosis with menopause and compare the health seeking behaviour of women related to menopause in different strata of society.

Study Design: A cross-sectional study.

Place and Duration of Study: Three different socioeconomic strata of Karachi from May till August 2004.

Methodology: A sample of 925 women, over 35 years of age, was selected from 16 clusters of 250 households (50 houses in each cluster). All apparently healthy women having age between 35 and 50 years were selected in the cluster houses. Those who were not willing to be the part of the study or giving history of taking treatment for any disease for more than 4 weeks were excluded. In-depth interviews were conducted at their houses by the fourth year medical students trained and supervised by the senior faculty of the Medical College. T-scores were calculated to get BMD (Bone Mineral Density) for all the subjects through heel ultrasound.

Results: A total of 287 women were found to be experiencing menopause. The mean age of menopause was 47.8 ± 4.7 years. Out of those 287 women, 135 (47%) wanted their menses to continue and 235 (82%) had consulted a physician after menopause. There was a significantly lower score of BMD of postmenopausal women (mean = -1.833 ± 0.65) compared to pre-menopausal women (mean = -1.597 ± 0.60 , $p=0.016$). Out of the 925 women interviewed, 53% had consulted a physician for various symptoms related to menopause. The symptoms experienced by pre-menopausal women included lack of sleep (25%), fear of becoming sterile (13%) and urinary incontinence (18%).

Conclusion: The average age of menopause was found to be similar to other studies of the country. Lower bone mineral density was found in greater proportion among older females. Majority needed intervention inclusive of awareness through health education and medication.

Key words: Menopause. Age. Bone mineral density. Health seeking behaviour. Symptoms.

INTRODUCTION

One of the implications of menopause is post-menopausal osteoporosis, the resultant of bone remodeling in the skeleton secondary to estrogen deficiency. Bone remodeling rates have been shown to double at menopause, triple 13 years later and remain elevated till osteoporosis, contributing to the age related skeletal fragility in women.¹ Osteoporosis affects approximately one in 6 women over the age of 50 in the west. It is characterized by reduction in the quantity of bone during aging process without changing its chemical composition.² The loss of trabecular bone is 50% whereas loss of cortical bone is 5% and seen more rapidly during first 3-4 years after menopause.

Proportion of elderly in Pakistan is growing steadily and persons more than 65 years are estimated to be 4%.

¹ Department of Community Medicine/Community Health Sciences², Karachi Medical and Dental College, Karachi.

³ Department of Obstetrics and Gynaecology, Abbasi Shaheed Hospital, Karachi.

Correspondence: Dr. Farah Asad, A-517, Sector 11-B, North Karachi, Karachi-75850.

E-mail: mansuri_21@hotmail.com

Received August 02, 2007; accepted January 23, 2009.

Over half of women over the age of 60 years live in the developing countries.³ Health care providers in developing countries often have limited information regarding physical, psychological and social problems of aging. These women do not understand their unique health risks. Moreover, their financial and physical limitations further reduce their access to medical services.^{4,5}

The average age at menopause in the developed nations is 51 years while the worldwide life expectancy of women has lengthened to approximately 62 years.¹ According to local studies, the average age at menopause in Pakistan is estimated to be 47 years while female life expectancy is 64 years as compared to 70 years in other Asian countries.² The rural study in Punjab province reported mean age at menopause 49 ± 3.6 years; the median being 50 years. The majority of women (22.3%) reached menopause at 50 years followed by 13.9%, who became menopausal at 49 years.⁶

Menopause is said to have occurred if menstruation has stopped for at least one year. The word 'menopause' refers to the last menstrual bleed and the diagnosis is retrospective. It is generally considered to have occurred retrospectively after one year of amenorrhoea.

Single plasma FSH level >15 IU/L would be diagnostic of menopausal state. It may occur naturally, surgically-induced or occurs secondary to medical disorders.^{7,8}

The symptoms experienced by menopausal women reported in literature include sleep disturbances inclusive of insomnia and quality of sleep.⁹ The other symptoms include urinary incontinence, hot flushes, poor memory, loss of hair and body, back or joint aches/pains.¹⁰⁻¹³

Comparative studies have depicted a lower Bone Mineral Density (BMD) in Hong Kong Chinese women than in Caucasians whereas others indicate that if weight, height and other factors are controlled, BMD and bone mass do not differ amongst Asian and White women.^{14,15} Amongst Indian women of a low income group, BMD and T-scores at all skeletal sites were much lower than values reported from developed countries, indicative of a high prevalence of osteopenia and osteoporosis.¹⁶ In Pakistan, very little data is available on the bone mass status of peri- and postmenopausal women and it is assumed that they are deficient considering the dietary, economic and educational status of the population at large.

The bone mineral density is measured conventionally by Dual Energy X-ray Absorptiometry (DEXA), which is a costly and highly technical procedure. Ultrasound of heel is now frequently used and moderately comparable with DEXA for assessing the BMD in community studies and first level health care facilities due to its cost-effectiveness and convenience.¹⁷ There are various measurements criteria like speed of sound and stiffness index of bone and the T-score. Latter is used to compare the patient's BMD with the mean value for individuals of the same age. A low T-score indicates etiology other than age related bone loss. According to a WHO report, the normal value for T-score is within one standard deviation of the mean value for young adults (-1 to +1). Osteopenia is present when the T-score lies between -1 and -2.5. Osteoporosis is present when T-score is less than -2.5.^{18,19} Using this ultrasound in Vietnam, a higher prevalence of osteoporosis was found in rural postmenopausal and urban peri-menopausal women.²⁰ A higher level of education was associated with better BMDs and lower prevalence of osteoporosis among postmenopausal Chinese women.²¹ A recent Pakistani study that used this WHO criteria quoted that 35.36% of women had osteopenia, and 12.01% had osteoporosis (T-score < -2.5).⁴

This study was undertaken to obtain an average age of menopause in a random sample of women of three socioeconomic strata of Karachi and to assess the association of menopause with osteopenia and osteoporosis in 3 women, using BMD and T-scores for evaluation; to assess and compare the health seeking behaviour of women related to menopause in different strata of society.

METHODOLOGY

This cross-sectional study was conducted from May to August 2004, in Karachi. Sixteen clusters in three stratas of society (defined on the basis of socioeconomic status) were selected randomly through the Federal Bureau of Statistics. Each cluster consisted of approximately 250 households and from each cluster 50 houses were selected through systematic random sampling to get a total of 800 households. All women over 35 years of age in the houses were interviewed. Any house with no women in that age group was discarded and no replacement was done. The clusters consisted of six squatter settlements (2 each in North Nazimabad and Gulshan-e Iqbal while one each in Liaquatabad and Federal B Area), 5 middle income communities (3 in North Nazimabad and 2 in Gulshan-e-Iqbal) and 5 high income communities (2 each in North Nazimabad and Clifton and one in Gulshan-e-Iqbal) of Karachi.

In-depth interviews were conducted at their houses by the fourth year medical students trained and supervised by the senior faculty of the college. Interview and questions consisted of their knowledge, attitude and practices related to menopause. Their health problems related to menopause were assessed through directional questions asking about relevant signs and symptoms.

BMD was measured through the use of heel ultrasound done at site and T-scores were calculated. The machine used for this study was USA made; model number 03329, Hologic Sahara, Bedford. Ethical approval was taken from the ethical committee of the college. BMD could only be measured for 925 women, out of whom 285 were postmenopausal.

SPSS 11 was used for data entry and analysis. Association of BMD to age, menopausal status and socioeconomic status was tested by using Chi-square test.

RESULTS

A total of 285 women, out of the total 925 women tested for BMD, belonged to the menopausal group. The mean age of menopause was 47.094±4.689 years (95% CI, 46.82–47.64). Out of the total 925 women, 300 (32.4%) had osteopenia and 62 (6.7%) had osteoporosis. A higher proportion of women in low income group had lower BMD (Table I). Thirty eight percent (38%) women over 60 years and 16% over 45 years had osteopenia.

Fifty nine percent (n=541) women were experiencing symptoms related to menopause. These 541 women were asked as to how these symptoms were affecting their lives and 41.9%, (n=227) reported lack of sleep, 21.6% (n=117) had stress due to fear of becoming sterile and 30.4% (n=165) had urinary incontinence. Out of those 541 women, 349 had discussed it with

Table I: Relationship of osteopenia and osteoporosis with menopause socioeconomic status of women.

Characteristics	Variables affecting bone mineral density n=925	Bone mineral density*						P-value
		Normal n=563 z ≥ -1		Osteopenia n=300 -2.5 ≥ z ≤ -1		Osteoporosis n=62 z ≤ -2.5		
		n	Percentage	N	Percentage	N	Percentage	
Menopausal status	Pre-menopausal n=138	95	68.8	38	27.5	05	03.6	0.000
	Peri-menopausal n=502	375	74.7	115	22.9	12	02.4	
	Menopausal n=285	93	32.6	147	51.6	45	15.8	
Socioeconomic status	Upper income group n=221	132	59.7	70	31.7	19	08.6	0.000
	Middle income group n=495	334	67.5	142	28.7	19	03.8	
	Low income group n=209	97	46.4	88	42.1	24	11.5	
Clinical symptoms	Experiencing symptoms n=541	329	60.8	171	31.6	41	07.6	0.414
Quality of life measures	Symptoms affecting the normal life of women (131)	80	61.1	43	32.8	08	06.1	0.956
Age of participants	Women 35-45 years of age (n=608)	470	77.3	126	20.7	12	02.1	0.000
	Women 46-60 years of age (n=256)	86	33.6	143	55.9	27	10.5	
	Women >61 years of age (n=61)	7	11.5	31	50.8	23	37.7	

* percentages are across the rows amongst each independent variable

Table II: Relationship of socioeconomic status (SES) with health and health seeking behaviour related to menopause.

Questions asked from all women n=925	Socioeconomic groups						P-value
	Lower n=221		Middle n=495		High n=209		
	N	Percentage	N	Percentage	N	Percentage	
Experiencing symptoms	130	58.8	292	59.0	119	56.9	0.874
Discussed symptoms with someone	81	36.7	162	32.7	106	50.7	0.000
The symptoms affecting life	34	15.4	82	16.6	15	7.2	0.004
Experiencing any diseases related to reproductive health	79	35.7	159	32.1	40	19.1	0.000
A women should consult physician in pre-menopause	117	52.9	265	53.5	109	52.2	0.944
Consulted a physician in the pre-menopausal stage	117	52.9	265	53.5	109	52.2	0.944
A women should consult a physician in menopausal stage	91	41.2	209	42.2	89	42.6	0.951
Consulted a physician in the menopausal stage	72	32.6	174	35.2	82	39.2	0.346
A women should consult a physician in postmenopausal stage	26	11.8	85	17.2	56	26.8	0.000
Consulted a physician in the postmenopausal stage	54	24.4	130	26.3	64	30.6	0.323
A women should take some medication for menopause	84	38.0	162	32.7	45	21.5	0.001

Percentage in each category is from the total number of women in that SES group, hence they will not add upto a 100% in rows or columns

someone, which included a close family member by 96 women, friends by 69 women and medical personnel by 184 women (Table II).

When asked about their health seeking behaviour, a majority of the women replied that one should consult a physician during pre-menopausal stage (53%), a lesser proportion believed in consulting during the menopausal stage (42%) and only 18% thought that consultation is required in postmenopausal stage. In postmenopausal stage, more women consulted a physician, even though they said that it was not required, with a significant (p<0.001) difference amongst socioeconomic groups. Only 31% of the women said that medication should be taken during menopausal time and there was a statistically significant difference amongst the three socioeconomic groups (p<0.001). Out of those 291 women, 51.5% (n=150) said use of hormones, 46.3% (n=135) said herbal drugs and 2% (n=6) named other drugs (refer to Table II).

DISCUSSION

The present sample of 285 menopausal women found the mean age of menopause to be 47 years, which is similar to the mean age quoted before in studies done in Pakistan.²²⁻²³ But in few studies, carried out in the two

extremes of educational strata, it was found to be higher as 54.4 years and 50 years respectively.^{24,25} As we relied on the age, reported by the respondents, and sample comprised of urban communities, there is a chance that actual age of menopause may be higher because of the fact that Pakistani women usually underestimate their age knowingly or unknowingly.

It was found that 32.4% women had osteopenia and 6.7% had osteoporosis, which is similar to the data reported from Pakistan.²⁴ While a study done in Turkey reported 39.2% prevalence of osteopenia and 16.2% of osteoporosis.²⁶ This may be due to differences in diet and physical activity practices.

Older age was associated with osteopenia and osteoporosis; it was found that 16% women over the age of 45 years had osteoporosis, which was similar to western studies where one in 6 women over the age of 50 were affected.²⁷ The results are also congruent with the study by Russel-Aulet *et al.*, which reported that Asian women had similar BMD at various ages and it was only dependent on their height and weight.¹⁰

Fifty nine percent women were experiencing symptoms related to menopause. The symptoms experienced by women included lack of sleep, urinary incontinence and

fear of sterility that are congruent with international and local studies.²⁸⁻²⁹

A majority of women thought that they should consult a physician during pre-menopausal stage, nevertheless, most of them consulted a physician during post-menopausal stage, even though they said that it was not required. A one-third of them agreed that medication should be taken during menopausal time and most of them mentioned hormones. These results clearly identify that there is awareness of the body's hormonal needs and women are concerned about their reproductive health.

There was a need to cater to the needs of these menopausal women through primary health care services and training of private practitioners in dealing with such women. Mass Media could be used to address the issue and provide information to women with lower levels of education and limited access to health care providers.

The investigators used ultrasound heel as an economical screening test for osteopenia and osteoporosis for this large sample but validity of the results would have been better with DEXA testing.

CONCLUSION

The average age of menopause was 47±4.7 years. Women with age above 45 years had significantly low BMD as compared to younger females.

A majority of women were aware of manifestations specific of menopause and felt that they would need to consult the physicians during that time. In majority of females the quality of life was affected as they were not taking any proper medication for their symptoms.

Acknowledgement: The authors are thankful for the technical support of Novartis Pharmaceutical Company, who extended their help by providing free BMD through their mobile unit.

REFERENCES

- Cheung AM, Chaudhry R, Kapral M, Jackevicius C, Robinson G. Perimenopausal and postmenopausal health. *BMC Womens Health* 2004; **4** (Suppl 1):S23.
- Lau EM, Lynn H, Woo J, Melton LJ 3rd. Areal and volumetric bone density in Hong Kong Chinese: a comparison with Caucasians living in the United States. *Osteoporos Int* 2003; **14**:583-8.
- Samad S, Qureshi R. RH in the national and regional: context. In: Farooqi MS, Samad SA, (edi). Manual for physicians, reproductive health. Karachi: *College of Physicians and Surgeons Pakistan*; 2002:p.3-8.
- Baig LA, Karim SA. Age at menopause, and knowledge of and attitudes to menopause, of women in Karachi, Pakistan. *J Br Menopause Soc* 2006; **12**:71-4.
- Elias C, Sherris J. Reproductive and sexual health of older women in developing countries. *BMJ* 2003; **327**: 64-5.
- Yahya S, Rehan N. Age, pattern and symptoms of menopause among rural women of Lahore. *J Ayub Med Coll (Abbottabad)* 2002; **14**:9-12.
- Rees M, Purdie DW, (edi). Management of the menopause: the handbook. 4th ed. London: *Royal Society of Medicine Press*, 2006.
- Tayyab M, Sohail R. Menopause and hormone replacement therapy. In: Farooqi MS, Samad S, (edi). Manual for physicians, Karachi: *College of Physicians and Surgeons Pakistan*; 2002:p.78-81.
- Recker R, Lappe J, Davies KM, Heaney R. Bone remodeling increases substantially in the years after menopause and remains increased in older osteoporosis patients. *J Bone Miner Res* 2004; **19**:1628-33.
- Russell-Aulet M, Wang J, Thornton JC, Colt EW, Pierson RN Jr. Bone mineral density and mass in a cross-sectional study of white and Asian women. *J Bone Miner Res* 1993; **8**:575-82.
- Shatrugna V, Kulkarni B, Kumar PA, Rani KU, Balakrishna N. Bone status of Indian women from a low-income group and its relationship to the nutritional status. *Osteoporos Int* 2005; **16**: 1827-35.
- Samina Yahya, Rehan N. Perceptions of menopause among rural women of Lahore. *J Coll Physicians Surg Pak* 2003; **13**:252-4.
- Hsu HC, Lin MH. Exploring quality of sleep and its related factors among menopausal women. *J Nurs Res* 2005; **13**:153-64. (School of Nursing, Chang-Gung Institute of Technology, Taiwan).
- Song YF, Zhang WJ, Song J, Xu B. Prevalence and risk factors of urinary incontinence in Fuzhou Chinese women. *Chin Med J (Engl)* 2005; **118**:887-92.
- Haines CJ, Xing SM, Park KH, Holinka CF, Ausmanas MK. Prevalence of menopausal symptoms in different ethnic groups of Asian women and responsiveness to therapy with three doses of conjugated estrogens/medroxyprogesterone acetate: the Pan-Asia menopause (PAM) study. *Maturitas* 2005; **52**:264-76.
- Vu TT, Nguyen CK, Nguyen TL, Le BM, NguyenTrung Le D, Bui TN, et al. Determining the prevalence of osteoporosis and related factors using quantitative ultrasound in Vietnamese adult women. *Am J Epidemiol* 2005; **161**:824-30.
- Manonai J, Chittacharoen A, Sarit-apirak S, Udomsubpayakul U, Khanacharoen A, Theppisai U. Lower urinary tract symptoms in Thai women attending the menopause clinic: prevalence and associated factors. *J Med Assoc Thai* 2004; **87**:1265-9.
- Ho SC, Chen YM, Woo JL. Educational level and osteoporosis risk in postmenopausal Chinese women. *Am J Epidemiol* 2005; **161**:680-90.
- Ikeda T, Makita K, Ishitani K, Takamatsu K, Horiguchi F, Nozawa S. Status of climactical symptoms among middle-aged to elderly Japanese women: comparison of general healthy women with women presenting at a menopausal clinic. *J Obstet Gynaecol Res* 2005; **31**:164-71.
- Im EO, Chee W. A descriptive internet survey on menopausal symptoms: five ethnic groups of Asian-American university faculty and staff. *J Transcult Nurs* 2005; **16**:126-35.

21. Oskay UY, Beji NK, Yalcin O. A study on urogenital complaints of postmenopausal women aged 50 and over. *Acta Obstet Gynecol Scand* 2005; **84**:72-8.
22. Kaur S, Walia I, Singh A. How menopause affects the lives of women in sub-urban Chandigarh, India. *Climacteric* 2004; **7**: 175-80.
23. Ku SY, Kang JW, Kim H, Ku PS, Lee SH, Suh CS, *et al.* Regional differences in age at menopause between Korean-Korean and Korean-Chinese. *Menopause* 2004; **11**:569-74.
24. Syeda Batool M, Gule Erum. Knowledge and attitude of older women towards menopause. *J Coll Physicians Surg Pak* 2003; **13**: 621-4.
25. Saima Y, Rehan N. Age, pattern and symptoms of menopause among rural women of Lahore. *J Ayub Med Coll (Abbottab)* 2002; **14**:9-12.
26. Demir B, Haberal A, Geyik P, Baskan B, Ozturkoglu E, Karacay O, *et al.* Identification of the risk factors for osteoporosis among postmenopausal women. *Maturitas* 2008; **60**:253-6.
27. Anderson D, Yoshizawa T, Gollschewski S, Atogami F, Courtney M. Relationship between menopausal symptoms and menopausal status in Australian and Japanese women: preliminary analysis. *Nurs Health Sci* 2004; **6**:173-80.
28. Lawrenson R, Nicholls P, Rivers-Latham R, Brown T, Barnardo J, Gray R. PIXI bone density screening for osteoporosis in postmenopausal women. *Maturitas* 2006; **53**:245-51.
29. Mehreen A, Rabia H, Shaheen S, Tauheed S. Age and symptomatology of menopause in Karachi, Pakistan. *Pak J Physiol* 2007; **3**:41-4.

